Permit Fact Sheet

** The permit was modified to include an Outfall for Land Application from an approved off-site storage in permit section 5.2 and minor surface water typo corrections. Changes associated with the modification are highlighted in gray. The section number formatting in the fact sheet was updated to be consistent throughout the document. This does not affect any permit conditions or permit formatting. **

1 General Information

Permit Number:	WI-0024597-09-0		
Permittee Name:	MADISON METROPOLITAN SEWERAGE DISTRICT		
Address: City/State/Zip:	Nine Springs Wastewater Treatment Facility 1610 Moorland Rd Madison WI 53713		
Discharge Location:	Outfall 001: Badfish Creek – SE ¼ of NE ¼ of Sec. 19, T6N, R10E, Town of Dunn (Lat: 42.97119° N / 89.35259° W) Outfall 005: Badger Mill Creek – SW ¼ of NW ¼ of Sec. 13, T6N, R8E, Town of Verona (Lat: 42.99414° N / Lon: 89.50400° W)		
Receiving Water:	Outfall 001: Badfish Creek (Lower Badfish Creek Watershed, LR07 – Lower Rock River Basin) 005: Badger Mill Creek (Upper Sugar River Watershed, SP15 – Sugar-Pecatonica Basin) 008: Groundwater (Yahara River & Lake Monona Watershed – Lower Rock River Basin) All in Dane County		
StreamFlow ($Q_{7,10}$):	Badfish Creek = 0 cfs Badger Mill Creek = <0.01 cfs		
Stream Classification:	Badfish Creek – Limited Aquatic Life at point of discharge; Limited Forage Fish approximately 5 miles down-stream at the confluence with Oregon Branch Badger Mill Creek – Limited Forage Fish at point of discharge; Coldwater Community approximately 4 miles downstream at STH 69		
Design Flow(s)		Outfall 001	Outfall 005
	Daily Maximum	65 MGD	3.6 MGD
	Weekly Maximum	62.5 MGD	3.6 MGD
	Monthly Maximum	57.5 MGD	3.6 MGD
	Annual Average	50 MGD	3.6 MGD
Significant Industrial Loading?	Yes – 19 Categorical Industrial Users and 20 Significant Industrial Users, plus contaminated groundwater from Hydrite Groundwater Barrier System.		
Operator at Proper Grade?	Yes – This is an Advanced Facility with required Subclasses of: A1 – Suspended Growth Processes; B – Solids Separation; C – Biological Solids/Sludges; P – Total Phosphorus; D – Disinfection; and L – Laboratory. Multiple operators fully certified.		
Pretreatment Program Approval Date:	January 1, 1984		

2 Facility Description

The Nine Springs Wastewater Treatment Plant is located at 1610 Moorland Road, Madison, Wisconsin and handles the wastewater from five cities, seven villages and some or all of 10 towns representing 28 separate sanitary districts, all located in Dane County. Preliminary treatment is performed by fine screening of inorganic solids and separation of grit in vortex grit tanks. The inorganic solids and grit are hauled to the Dane County Landfill for disposal. The wastewater receives primary and advanced secondary treatment. Sludge from the primary settling tanks is thickened in three gravity thickener tanks. The advanced secondary treatment system is composed of aeration tanks with selectors and clarifiers. Phosphorus removal is accomplished biologically in this process. Following final clarification, the treated water is disinfected using ultraviolet disinfection on a seasonal basis from April 15 to October 15. Treated effluent is discharged to two receiving streams - Badfish Creek and Badger Mill Creek.

The thickened primary sludge and thickened WAS are fed to an acid-phase anaerobic digester process. Following this process, the sludge is further anaerobically digested at mesophilic temperatures. Approximately 85% of the digested biosolids are then thickened by gravity belt thickeners and temporarily stored in Metrogro Storage Tanks before being recycled through land application on agricultural land. A smaller portion, approximately 15% of the mesophilicly digested biosolids is further digested at thermophilic temperatures to meet EPA time/temperature requirements for Class A Biosolids. These biosolids are then dewatered on a centrifuge. The resulting cake biosolids can be managed alone or mixed with amendments such as sand and sawdust to produce a soil-like material. Phosphorus in the form of struvite is harvested from waste streams using the Ostara process.

Effluent sampling is performed upstream of the flow split to the separate outfalls; therefore, all data is the same for both outfalls.

In order to comply with the total phosphorus effluent limitations calculated based on s. NR 217.13, Wis. Adm. Code, and as set forth in the Rock River TMDL, Madison Met will implement a Department-approved Adaptive Management Plan (Plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2017)) to pursue final phosphorus limit compliance. This effort will involve close partnerships with the Madison Metropolitan Sewerage District, Village of Oregon, City of Stoughton, WDNR Nevin Fish Hatchery, various Municipal Separate Storm Sewer Systems (MS4s) within the Yahara River watershed, County Land & Water Conservation Departments, NGOs, Lake Management Groups, and the agricultural community in an effort to reduce in-stream phosphorus concentration in the Yahara River watershed.

The treatment facility is covered under a “no exposure certification” for stormwater. The sewage collection system for Madison Metropolitan Sewerage district and its satellite sewage collection systems are separate sanitary sewer systems with one overflow structure. The permittee has been found to be in substantial compliance with its current permit.

The attached water quality based effluent limits recommendations memo by the Water Quality Bureau for this permit reissuance dated May 19, 2017 contains additional information regarding this discharge to Badfish Creek and Badger Mill Creek. The WQBEL memo also includes a map depicting the locations of the Madison Metropolitan Sewerage Districts two outfalls.

3 Sample Points

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
701	40 MGD (6/1/14 – 5/31/17)	Influent: 24-hour flow proportional composite samplers located prior to screening and grit removal at each of the five force mains at the headworks building. Results are reported on a flow weighted basis.
001	40 MGD	Effluent: 24-hour flow proportional composite sampler intake located at effluent building after UV disinfection. Grab samples

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
	(6/1/14 – 5/31/17)	taken in effluent well prior to discharge to Badfish Creek.
005	3.3 MGD (6/1/14 – 5/31/17)	Effluent: 24-hour flow proportional composite sampler intake located at effluent building after UV disinfection. Grab samples taken in effluent well prior to discharge to Badger Mill Creek.
008	20,928 gal/yr (2014 – 2016)	Spray Irrigation: Final effluent diverted to the Nine Springs Golf Course from April 15th through October 15th. Monitoring is only required while irrigation is occurring. Sample results are the same as sample point 001.
002	7,464 US Tons Land Applied (2016)	Class B, Liquid, Anaerobically (mesophilic) digested, gravity belt thickened liquid biosolids. Representative samples are taken from Metrogro loading pumps.
024	New Sample Point	Class B, Cake, Anaerobically (mesophilic) digested, gravity belt thickened, centrifuged biosolids. Representative samples are taken from the cake storage building. Monitor for Lists 1, 2, 3 and 4. Department may allow monitoring of metals (List 1) at location providing similar results (See Section 5.2.1.3). Monitoring for List 3 (pathogens) shall include Treatment Process OR Pathogen Density for compliance purposes. Monitoring shall apply only when the outfall is active.
025	New Sample Point	Class B, Cake, Composted, Anaerobically (mesophilic) digested, gravity belt thickened, centrifuged, composted biosolids. Representative samples are taken from the composted solids in the compost pile and from storage. Monitor for List 1, 2, 3 and 4. Department may allow monitoring of metals (List 1) at location providing similar results (See Section 5.2.1.3. However, if additional sludge feedstocks other than Madison Metropolitan Sewerage District Wastewater Treatment Facility sludge are used, Section 5.2.1.3 does not apply to this outfall.). Monitoring for List 3 (pathogens) shall include Treatment Process OR Pathogen Density for compliance purposes. Monitoring shall apply only when the outfall is active.
026	New Sample Point	Land Application from Off-Site Storage Tank, above ground concrete manure storage unit, with an allowable capacity of 2.9 MG, located in the NW ¼, SE ¼, Section 24, T06N, R08E, consisting of class B, liquid, anaerobically (mesophilic) digested, gravity belt thickened liquid biosolids. Representative samples shall be collected from the dragline pump sampling port. The tank contents are mixed prior to land application.
011	New Sample Point	Class A, Cake from Storage, Anaerobically (thermophilic treatment after mesophilic treatment) digested, Time-Temperature Batch, gravity belt thickened, centrifuged biosolids from storage. Monitor for Lists 1, 2, 3 and 4. Representative samples are taken at the

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
		distribution point at the Madison Metropolitan Sewerage District Wastewater Treatment Facility. Monitoring shall apply only when outfall is active.
013	New Sample Point	Class A, Cake, Composted, Anaerobically (thermophilic treatment after mesophilic treatment) digested, Time-Temperature Batch, gravity belt thickened, centrifuged biosolids. A representative composite sample will be made up of grab samples taken at multiple depths and locations within the distribution pile. Monitor for Lists 1, 2, 3 and 4. This sample point currently covers the pilot composting operation that was approved for 35 cubic yards/yr. Distribution of additional compost will be subject to department review. As the pilot project progresses, metals monitoring may be waived with department approval where feedstocks are known.
022	New Sample Point	Class A, Liquid, Anaerobically (thermophilic treatment after mesophilic treatment) digested, Time-Temperature Batch, gravity belt thickened, biosolids. Collection of pathogen density required immediately after Class A treatment process. Monitor for List 3 only. Note that the Class A Sludge: Composting Process requirements in Section 7.7 may not apply if all sludge feedstocks have been determined to meet Class A treatment requirements prior to the composting treatment process.
023	New Sample Point	Class A, Cake, Composted, Anaerobically (thermophilic treatment after mesophilic treatment) digested, Time-Temperature Batch, gravity belt thickened, centrifuged biosolids. Collection of pathogen density required immediately after Composting and prior to storage. Monitor for List 3, except that if additional sludge feedstocks other than those already determined to meet exceptional quality requirements are used in the compost treatment process, then the permittee shall notify the department to activate Lists 1, 2 and 4 for this outfall. Monitoring shall apply only when outfall is active.
012	New Sample Point	Struvite Harvesting Process: Tons of product produced must be reported on an annual basis.
111	N/A	In Plant Mercury: collect a mercury field blank at the effluent building using the Clean Hands/Dirty Hands sample collection procedure excerpted from EPA Method 1669.
112	Diversion Structure Not Used in Past Three Years	Diversion Structure: during times of wet weather, treated flow prior to disinfection is conveyed out to storage lagoons and either discharged back to east plant primary channel or to Nine Springs Creek tributary.
016	New Sample Point	Automatically-Activated Overflow: located in City of Madison at manhole 06-102 - Drainage ditch near PS6. During times of wet weather untreated flow could be discharged to Starkweather Creek

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
		near Atwood Ave.
017	New Sample Point	Automatically-Activated Overflow: located in City of Monona at manhole PS7 - Entrance chamber behind PS7. During times of wet weather untreated flow could be discharged to the Yahara River between Lake Monona and Mud Lake.
018	New Sample Point	Automatically-Activated Overflow: located in City of Madison at manhole 08-100 - North side of Wingra Creek across from PS8. During times of wet weather untreated flow could be discharged to Wingra Creek near Fish Hatchery Rd.
019	New Sample Point	Automatically-Activated Overflow: located in Village of McFarland at manhole 09-108 - East side of Hwy. 51, north of Yahara River, south of Yahara Drive. During times of wet weather untreated flow could be discharged to the Yahara River below Lake Waubesa at Hwy 51.
020	New Sample Point	Automatically-Activated Overflow: located in Town of Dunn at manhole PS11 near PS11 entrance chamber. During times of wet weather untreated flow could be discharged to Nine Springs Creek.
021	New Sample Point	Automatically-Activated Overflow: located in City of Madison at manhole 13-105 upstream of PS13 - Along drainage ditch, west of Hwy 51 at Dane County Airport access road. Inside airport perimeter fence. During times of wet weather untreated flow could be discharged to Starkweather Creek East of airport near Hwy. 51.

4 Influent - Proposed Monitoring

4.1 Sample Point Number: 701- INFLUENT TO PLANT

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Continuous	Continuous	
BOD_5, Total		mg/L	Daily	24-Hr Flow Prop Comp	
$CBOD_5$, Total		mg/L	Daily	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	Daily	24-Hr Flow Prop Comp	
Cadmium, Total		ug/L	Monthly	24-Hr Flow	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Recoverable				Prop Comp	
Chromium, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	
Copper, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	
Lead, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	
Nickel, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	
Zinc, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	
Mercury, Total Recoverable		ng/L	Monthly	Grab	See mercury monitoring requirements at subsection 1.2.1.3 in the permit.

4.1.1 Changes from Previous Permit:

Added $CBOD_5$ daily monitoring.

4.1.2 Explanation of Monitoring Requirements

Typical influent monitoring parameters and frequencies for a major municipal treatment facility of this size with an approved local pretreatment program. Influent $CBOD_5$ monitoring has been added since effluent BOD_5 limits have been replaced with $CBOD_5$ limits and the 85% removal requirement still applies.

5 In-plant - Proposed Monitoring

5.1 Sample Point Number: 111- In plant mercury monitoring

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Mercury, Total Recoverable		ng/L	Monthly	Blank	See mercury monitoring requirements at subsection 2.2.1.1 in the permit.

5.1.1 Changes from Previous Permit Explanation of Monitoring Requirements:

No changes from current permit. A mercury field blank shall be collected using the clean hands/dirty hands sample collection technique for every day that mercury influent and effluent samples are collected.

5.2 Sample Point Number: 112- Diversion structure

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Volume		MGD	Per Occurrence	Estimated	
Fecal Coliform		#/100 ml	Per Occurrence	Grab	

5.2.1 Changes from Previous Permit & Explanation of Monitoring Requirements:

No changes from current permit. This sample point records the volume diverted and the fecal coliform concentrations in the diverted flow. Outfall not used during previous three years. Any discharge to Nine Springs Creek is considered bypassing and is prohibited. See subsections 7.2.6 'Bypass' in the Standard Requirements section of the permit for more information.

6 Surface Water - Proposed Monitoring and Limitations

6.1 Sample Point Number: 001- EFFL/BADFISH CREEK

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Continuous	Continuous	
CBOD5	Monthly Avg	19 mg/L	Daily	24-Hr Flow Prop Comp	
CBOD5	Weekly Avg	20 mg/L	Daily	24-Hr Flow Prop Comp	
CBOD5	Monthly Avg	7,923 lbs/day	Daily	Calculated	
CBOD5	Weekly Avg	8,340 lbs/day	Daily	Calculated	
Suspended Solids, Total	Monthly Avg	20 mg/L	Daily	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	23 mg/L	Daily	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	6,860 lbs/day	Daily	Calculated	Limit in effect January annually.
Suspended Solids, Total	Monthly Avg	8,340 lbs/day	Daily	Calculated	Limit in effect February, April, June and November annually.
Suspended Solids, Total	Monthly Avg	8,160 lbs/day	Daily	Calculated	Limit in effect March, May and July annually.
Suspended Solids, Total	Monthly Avg	7,080 lbs/day	Daily	Calculated	Limit in effect August annually.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Suspended Solids, Total	Monthly Avg	4,600 lbs/day	Daily	Calculated	Limit in effect September annually.
Suspended Solids, Total	Monthly Avg	7,180 lbs/day	Daily	Calculated	Limit in effect October annually.
Suspended Solids, Total	Monthly Avg	7,170 lbs/day	Daily	Calculated	Limit in effect December annually.
Suspended Solids, Total	Weekly Avg	9,591 lbs/day	Daily	Calculated	Limit in effect January through August and October through December annually.
Suspended Solids, Total	Weekly Avg	7,690 lbs/day	Daily	Calculated	Limit in effect September annually.
Dissolved Oxygen	Daily Min	5.0 mg/L	Daily	Continuous	See subsection 3.2.1.5 in the permit for Compliance with Dissolved Oxygen Limit.
pH Field	Daily Min	6.0 su	Daily	Grab	
pH Field	Daily Max	9.0 su	Daily	Grab	
Fecal Coliform	Geometric Mean - Monthly	400 #/100 ml	2/Week	Grab	Limit in effect April 15 through October 15 annually through October 15, 2022. Beginning March 1, 2023 limit is in effect March 1 through November 30 annually.
Fecal Coliform	Geometric Mean - Wkly	780 #/100 ml	2/Week	Grab	Limit in effect April 15 through October 15 annually through October 15, 2022. Beginning March 1, 2023 limit is in effect March 1 through November 30 annually.
Nitrogen, Ammonia (NH3-N) Total	Daily Max	17 mg/L	Daily	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	4.1 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect October through April annually.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	1.8 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect May through September annually.
Nitrogen, Ammonia	Weekly Avg	10 mg/L	Daily	24-Hr Flow	Limit in effect October

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
(NH3-N) Total				Prop Comp	through April annually.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	4.4 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect May through September annually.
Phosphorus, Total	Monthly Avg	1.0 mg/L	Daily	24-Hr Flow Prop Comp	
Phosphorus, Total	6-Month Avg	0.6 mg/L	Daily	24-Hr Flow Prop Comp	This is the Adaptive Management interim limit effective starting May 1, 2020. See subsection 3.2.1.6 in the permit for averaging periods and compliance determination. Future interim limit of 0.5 mg/L may be effective upon reissuance per Schedule 10.1.
Phosphorus, Total		lbs/day	Daily	Calculated	Calculate the daily mass discharge of phosphorus in lbs/day on the same days phosphorus sampling occurs.
Chloride	Weekly Avg	465 mg/L	Daily	24-Hr Flow Prop Comp	This is an interim limit in effect November 1 through March 31 annually. See subsections 3.2.1.11 in the permit for chloride source reduction measures and 10.1.2 below for the Chloride Target Value schedule.
Chloride	Weekly Avg	430 mg/L	Daily	24-Hr Flow Prop Comp	This is an interim limit in effect April 1 through October 31 annually. See subsections 3.2.1.11 in the permit for chloride source reduction measures and 10.1.2 below for the Chloride Target Value schedule.
Chloride		lbs/day	Daily	Calculated	Calculate the mass discharge of chloride in lbs/day on the same days

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					chloride sampling occurs.
Mercury, Total Recoverable	Daily Max	3.4 ng/L	Monthly	Grab	This is an Alternative Mercury Effluent Limit. See subsections 3.2.1.12 in the permit for Mercury Variance information, 3.2.1.13 for Mercury Monitoring requirements and 10.1.4 below for the mercury variance schedule.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Time Prop Comp	See subsection 3.2.1.14 in the permit for whole effluent toxicity (WET) testing monitoring dates and WET requirements.
Chronic WET		TUc	See Listed Qtr(s)	24-Hr Time Prop Comp	See subsection 3.2.1.14 in the permit for whole effluent toxicity (WET) testing monitoring dates and WET requirements.
Cadmium, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only
Chromium, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only
Copper, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only
Lead, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only
Nickel, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only
Zinc, Total Recoverable		ug/L	Monthly	24-Hr Flow Prop Comp	Monitoring Only
Nitrogen, Total Kjeldahl		mg/L	Quarterly	24-Hr Flow Prop Comp	Monitoring Only
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	24-Hr Flow Prop Comp	Monitoring Only
Nitrogen, Total		mg/L	Quarterly	Calculated	Monitoring Only

6.1.1 Rock River Total Maximum Daily Load

A total maximum daily load (TMDL) was developed for the Rock River Basin to determine the maximum amounts of phosphorus and sediment that can be discharged to protect and improve water quality. The Rock River Basin's TMDL was approved by the Environmental Protection Agency (EPA) in September 2011. These final effluent limits were derived from and comply with the applicable water quality criterion and are consistent with the assumptions and requirements of the EPA-approved Waste Load Allocation (WLA) for the Rock River. The entire report, Final_Rock_River_TMDL_Report_with_Tables.pdf, can be found on the DNR web site. (Available at dnr.wi.gov; search for; "Rock River TMDL Report"). The proposed permit includes limitations and requirements necessary to implement the recommendations of the TMDL. For specific limits see below.

6.1.2 Changes from Previous Permit for Outfall 001 – Badfish Creek

Madison Metropolitan Sewerage District (MMSD) has requested and the Department has approved substituting $CBOD_5$ limits in the reissued permit in place of the BOD_5 limits in the current permit. The monthly average and weekly average numerical concentration and mass limits shall remain the same, just the parameter will change. The MMSD WWTF discharge to Badfish Creek is in the Rock River TMDL, which was approved September 28, 2011. Weekly average and monthly average total suspended solids (TSS) mass limits as well as monthly average total phosphorus (TP) mass limits were calculated to comply with the TMDL. MMSD has TSS mass limits for certain months in its current permit that are more stringent than the TMDL mass limits for those same months and will be retained in the reissued permit. MMSD can easily meet the remaining TMDL TSS mass limits that take effect on the permit effective date.

Total phosphorus (TP) mass limits calculated for the Rock River TMDL along with TP concentration limits of 0.075 mg/L as a 6-month average and 0.225 mg/L as a monthly average calculated under s. NR 217.13, Wis. Adm. Code, are recommended; however, MMSD has requested and the Department has approved a plan to implement a watershed adaptive management approach under s. NR 217.18, Wis. Adm. Code, as a means for MMSD to achieve compliance with the phosphorus water quality standards in s. NR 102.06, Wis. Adm. Code. This adaptive management plan is a partnership between the City of Madison, City of Stoughton, Village of Oregon and the Wisconsin DNR Nevin Fish Hatchery plus various municipal separate storm sewer system (MS4s) within the Yahara River action area as defined in the adaptive management plan. A 1.0 mg/L monthly average TP limit will apply on the permit effective date and an adaptive management TP interim limit of 0.6 mg/L as a 6-month average will apply beginning the period from May 1, 2020 through October 31, 2020. MMSD currently has an alternative phosphorus limit of 1.5 mg/L as a monthly average.

The reissued permit will require MMSD to disinfect its effluent discharged to Badfish Creek (Outfall 001) from March 1 through November 30 annually beginning March 1, 2023. MMSD currently performs disinfection at Outfall 001 from April 15 through October 15 annually, which will continue from the permit effective date through October 15, 2022. There will be a new fecal coliform limit of 780 #/100 ml as a weekly geometric mean in addition to the current fecal coliform limit of 400 #/100 ml as a monthly geometric mean. Fecal coliform monitoring is required and limits are in effect during periods of disinfection. MMSD has applied for a continuation of a variance from the chronic water quality standard for chloride of 395 mg/L. This variance has been approved by EPA and MMSD will be required to maintain chloride effluent concentrations at or below interim (variance) limits of 465 mg/L for winter (November through March) and 430 mg/L for summer (April through October), continue to implement a Department-approved chloride source reduction measures plan and submit annual chloride reports per a Chloride Target Value schedule. MMSD has also applied for a continuation of a variance from the water quality standard for mercury based on the wildlife criterion of 1.3 ng/L as a monthly average. This variance has been approved by EPA and a daily maximum Alternative Mercury Effluent Limit (variance limit) of 3.4 ng/L will apply on the permit effective date, MMSD will be required to implement an approved mercury pollutant minimization program (PMP) plan and submit annual mercury progress reports per a Mercury PMP schedule. The reissued permit will require quarterly monitoring of total nitrogen parameters (total kjeldahl, nitrogen, nitrite + nitrate nitrogen and total nitrogen).

6.1.3 Explanation of Limits and Monitoring Requirements

Refer to the WQBEL memo for the detailed calculations, prepared by Rachel Fritz dated May 19, 2017 used for this reissuance.

Water Quality Based Limits and WET Requirements and Disinfection

$CBOD_5$ – Madison Metropolitan Sewerage District (MMSD) requested that the Department evaluate the potential for $CBOD_5$ limits in place of the current BOD_5 limits. Based on the factors considered in the May 19, 2017 WQBEL memo the Department determined that $CBOD_5$ limits were appropriate and were set equal to the existing BOD_5 limits in the current permit, namely 20 mg/L (8,340 lbs/day) as a weekly average and 19 mg/L (7,923 lbs/day) as a monthly average, both effective year-round.

Total Suspended Solids (concentration) – No changes are recommended in the permit limitations for Total Suspended Solids (TSS) concentration limits. Because the reference effluent flow rates and receiving water characteristics have not changed TSS concentration limits do not need to be re-evaluated at this time.

Total Suspended Solids (TMDL mass) – Weekly average and monthly average mass limits for total suspended solids were required to comply with the Rock River TMDL, and were derived consistent with the assumptions and requirements of the EPA approved waste load allocation (WLA) for the Rock River. Since the treatment plant can easily meet these new mass limits, which are equivalent to concentrations ranging from 11 mg/L to 20 mg/L as monthly averages and 18 mg/L to 34 mg/L as a weekly averages at the facility design flow of 50 MGD, no compliance schedule is included. As noted above, there are no changes proposed to concentration limits. The TMDL limits are in addition to the existing concentration limits for suspended solids of 20 mg/L monthly average and 23 mg/L weekly average in the current permit. The approved total suspended solids TMDL limits for this permittee are included in columns two and three of the following table, expressed as monthly average and weekly average effluents limits. However, MMSD's current permit contained a monthly average mass limit of 8,340 lbs/day and a weekly average mass limit of 9,591 lbs/day, both effective year-round. Since the current mass limits are more stringent than the TMDL mass limits for certain months, the more stringent limitations have been included in the proposed permit. As shown in the table below in the fourth and fifth columns, the recommended monthly average TSS mass limits for the months of February, April, June and November shall equal the limit from the current permit of 8,340 lbs/day, with the balance of the months set equal to the TMDL-derived mass limits. For weekly average TSS mass limits, the current mass limit of 9,591lbs/day is more stringent than all of the monthly TMDL-derived mass limits with the exception of the month of September, which shall equal 7,690 lbs/day.

Total Suspended Solids Effluent Limitations

Month	Monthly Ave TSS Effluent Limit from TMDL (lbs/day)	Weekly Ave TSS Effluent Limit from TMDL (lbs/day)	Recommended Monthly Ave TSS Effluent Limit* (lbs/day)	Recommended Weekly Ave TSS Effluent Limit* (lbs/day)
Jan	6860	11500	6860	**9591**
Feb	8470	14100	**8340**	**9591**
March	8160	13600	8160	**9591**
April	8430	14100	**8340**	**9591**
May	8160	13600	8160	**9591**
June	8430	14100	**8340**	**9591**
July	8160	13600	8160	**9591**
Aug	7080	11800	7080	**9591**
Sept	4600	7690	4600	7690
Oct	7180	12000	7180	**9591**
Nov	8430	14100	**8340**	**9591**
Dec	7170	12000	7170	**9591**

* Bolded numbers represent limitations that are being included in the reissued permit because the TSS limitations in the current permit are more stringent than the limitations resulting from the Rock River TMDL.

Dissolved Oxygen (DO) – The existing limitation of 5.0 mg/L as a daily minimum shall remain unchanged. See subsection 3.2.1.3 in the permit for determining compliance with the DO limits. DO is monitored continuously with results being record at 1-minute intervals. The hourly average result is reported. This modification corrected the sample type from grab to continuous.

pH – The categorical pH limits of 6.0 s.u. (standard pH units) as a daily minimum and 9.0 s.u. as a daily maximum are being retained unchanged.

Disinfection – Disinfection is required April 15 through October 15 annually through October 15, 2022. Beginning March 1, 2023 disinfection is required March 1 through November 30 annually. Disinfection is accomplished using an ultra-violet (UV) light mechanism.

Fecal Coliforms – The current permit has a fecal coliforms limit of 400 #/100 ml as a monthly geometric mean that is being retained in the reissued permit. Due to recent revisions to ch. NR 106 (effective September 1, 2016), whenever a monthly average limitation is determined necessary to protect water quality, a weekly average limit shall be calculated using procedures specified in s. NR 106.07(3)(e)4. Based on these calculations a fecal coliforms limit of 780 #/100 ml as a weekly geometric mean shall be included in the proposed permit. Fecal Coliform monitoring is required and limits are in effect during periods of disinfection.

Ammonia – Monthly and weekly average ammonia limits were not re-evaluated in the May 19, 2017 WQBEL memo because there have been no changes in the effluent and receiving water flows. The existing limitations shall be carried over into the reissued permit. Daily maximum ammonia limits may be based on the receiving water classification and effluent pH at the time of discharge using the two times acute toxicity criterion (2xATC) approach. Recent revisions to ch. NR 106, outline the option for using the 1-Q_{10} receiving water low flow and the conservation of mass equation is s. NR 106.06(4)(b) to calculate acute limitations. In MMSD's case, the existing daily maximum limit of 17 mg/L is more stringent than the daily maximum limits calculated using either the 2xATC or 1-Q_{10} approaches and will be retained in the permit due to antibacksliding/antidegradation rules (ch. NR 207).

Phosphorus – Phosphorus requirements are based on the Phosphorus Rules that became effective December 1, 2010 as detailed in chs. NR 102 Water Quality Standards and NR 217 Effluent Standards and Limitations for Phosphorus. See http://dnr.wi.gov/topic/surfacewater/phosphorus.html for details regarding the administrative rules for phosphorus discharges.

As noted below, total phosphorus mass limits based on the Rock River Total Maximum Daily Load (TMDL) Waste Load Allocation (WLA) along with s. NR 217.13, concentration limits have been determined necessary for MMSD. However, MMSD has requested and the Department has approved a plan to implement a watershed adaptive management approach under s. NR 217.18, as a means for MMSD to achieve compliance with the phosphorus water quality standard in s. NR 102.06, and the Rock River TMDL. The phosphorus limitations and conditions in the proposed permit reflect the approved adaptive management (AM) plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018). AM Plan No. WQT-2017-0003 (January 2017 and Amendment 1 (February 2018) is a partnership between the City of Stoughton, Village of Oregon, WDNR Nevin Fish Hatchery, Madison Metropolitan Sewage District and various Municipal Separate Storm Sewer Systems (MS4s) located in the Yahara River watershed. The AM Plan identifies the Yahara River action area, which encompasses the entire Yahara River watershed, where watershed projects shall be implemented to reduce phosphorus and total suspended solids loadings from point and non-point sources of these pollutants.

At the end of the first permit, the total minimum phosphorus reduction required is 5,329 lbs/yr. MMSD's portion of the total reduction is 4,625 lbs/yr.

The Adaptive Management Plan was written such that MMSD is solely responsible for coordinating in-stream monitoring and submittal of all required data and annual reports for all entities that are participating in the Yahara River Basin AM Plan; this includes the City of Stoughton, Village of Oregon, WDNR Nevin Fish Hatchery, and various MS4 partners.

Each entity has signed an Intergovernmental Agreement (IGA) indicating more details on roles and responsibilities. This IGA as well as the Memorandum of Understanding (MOU) that the Department signed with MMSD can be found in the appendix of the Adaptive Management Plan.

A Phosphorus Schedule is included in the permit that contains the required actions as described in s. NR 217.18, Wis. Adm. Code, related to milestones for adaptive management interim phosphorus effluent limits, including effective dates, required actions in the schedule related to renewal of the adaptive management plan for permit reissuance and a final milestone for the permittee to achieve water quality standards and adaptive management plan success. The schedule covers the entire three permit terms (15 years) of the adaptive management project. Compliance with the phosphorus in-stream water quality standard in s. NR 102.06, Wis. Adm. Code, may be obtained at an earlier date. Future implementation schedules will be dependent on the success and progress of the AM plan to date and reevaluated each permit reissuance. The Schedule may be modified or removed should compliance be attained at an earlier date. The schedule may also be modified at permit reissuance should new information be submitted.

Total phosphorus mass limits were calculated to comply with the Rock River TMDL and were derived consistent with the assumptions and requirements of the EPA-approved waste load allocation for the Rock River. Limits were determined using the code changes and the provision of the TMDL. For informational purposes, the final TMDL mass limits are presented in the following table:

Total Phosphorus Effluent Limitations

Month	Monthly Ave Total P Effluent Limit (lbs/day)
Jan	60.48
Feb	67.38
March	58.59
April	59.90
May	56.76
June	61.19
July	56.17
Aug	54.09
Sept	54.13
Oct	55.40
Nov	60.14
Dec	60.11

In addition to the TMDL-derived total phosphorus mass limits, additional water quality based concentration effluent limits under s. NR 217.13, were considered. The discharge location for the MMSD WWTF is classified as a limited aquatic life (LAL) stream. The Phosphorus Rules do not establish phosphorus water quality criteria for LAL streams; however, approximately four miles downstream of MMSD's outfall the stream classification changes to limited forage fish (LFF) past the Oregon Branch. Section NR 217.13(1)(b), provides for phosphorus WQBELs to protect downstream waters. A phosphorus water quality criterion of 0.075 mg/L applies for the LFF portion of Badfish Creek. The final water quality based effluent concentration limits of 0.075 mg/L as a 6-month seasonal average and 0.225 mg/L as a monthly average limit based on s. NR 217.13, are necessary to protect downstream water. The six-month seasonal averaging periods are May through October and November through April. These limits will go into effect at the end of three permit terms unless the adaptive management project is terminated per s. NR 217.18(3)(g), Wis. Adm. Code, in which case the limits may be imposed at an earlier date, or the phosphorus reductions specified in the adaptive management plan have been achieved. It is possible these limits would become effective sooner than three permit terms since Adaptive Management (AM) eligibility and applicable phosphorus limits will be reevaluated at each permit reissuance to determine if load reductions have been met and if facilities are able to pursue AM for an additional permit term. Additionally, new interim limits will apply for each subsequent AM permit term according to s. NR 217.18(3)(e), Wis. Adm. Code and will be effective in future permits.

Chloride – Acute (757 mg/L) and chronic (395 mg/L) chloride toxicity criteria for the protection of aquatic life are included in Tables 1 and 5 of ch. NR 105. Subchapter IV of ch. NR 106, establishes the procedure for calculating water quality based effluent limits for chloride. An analysis of chloride effluent data from MMSD's current permit term is included in the May 19, 2017 WQBEL memo. Since the calculated 1-day Upper 99th Percentile (P99) of MMSD's daily chloride results (489 mg/L) is less than the acute (daily maximum) chloride limit of 757 mg/L daily maximum chloride limits are unnecessary. The 4-day P99 of MMSD's weekly average chloride concentrations (446 mg/L) exceeds the weekly average chloride limit of 395 mg/L, and therefore weekly average chloride limits of 395 mg/L and 165,000 lbs/day (395 mg/L × 50 MGD × 8.34, rounded) are apparently needed. However, since chloride is not substantially reduced by standard wastewater treatment processes, and the installation and operation of alternative chloride removal processes may cause substantial and widespread adverse social and economic impacts in the area where the discharger is located, ch. NR 106, Subchapter VII, provides for a variance from chloride limitations if a permittee submits an application requesting such a variance and the US EPA grants the variance, which is considered a variance from state water quality standards. EPA approved MMSD's chloride variance on August 30, 2019.

MMSD has requested a continuation of a chloride variance that was granted for the current permit term. The current variance, which remains in effect until the permit is reissued, mistakenly established a target "limit" of 430 mg/L, effective September 30, 2015. Since the existing chloride variance was MMSD's first chloride variance a target "value", which is not an enforceable limit, would have been appropriate, and the reissued permit will have a target value of 419 mg/L as a weekly average as a goal for chloride reduction by the end of the reissued permit. During the WQBEL drafting process, MMSD requested chloride seasonal limits in a letter dated April 11, 2017 and provided documentation that the need for an increased limit during the winter months was necessary. Due to sufficient information, the Department set the interim chloride limits higher (465 mg/L) during the winter months of November through March and lower (430 mg/L) during the summer months of April through October. These values equal the 4-day P99s of discharge data from the two periods of months, rounded.

The mass limits of 200,000 lbs/day for Outfall 001 and 14,000 lbs/day for Outfall 005 were removed since interim mass limits for variances are typically not included in permits. Mass limits are included for chloride only as a final limit or as a target limit. At this time, the only limit included in the draft permit is an interim limit and therefore a mass limit does not need to be included.

MMSD has submitted an application requesting a chloride variance and as conditions of this variance MMSD has committed to maintaining weekly average chloride effluent levels at or below the seasonal interim limits described above, implementing the "Madison Metropolitan Sewerage District, Chloride Pollutant Minimization Program/Source Reduction Measures", plan dated May 2017 (attached to this fact sheet), and submit annual chloride progress reports as required by the Chloride Target Value schedule found at subsection 10.1.2 below.

Mercury – Actual flow is greater than 1.0 MGD so the mercury influent, effluent and field blank monitoring requirements for Major WWTFs in Subchapter III, NR 106.145, apply. Mercury effluent and field blank data generated during the current permit term were evaluated for sampling and analysis requirements in accordance with ss. NR 106.145 (9) and (10). The 30-day P99 of effluent results calculated using the procedures in s. NR 106.05(5), was 1.6 ng/L, which is greater than the water quality standard for the protection of wildlife of 1.3 ng/L (the most stringent criterion for this substance), so a limit is necessary (WQBEL). However, s. NR 106.145(4), provides for a variance from water quality standards for this substance in light of its presence in the environment. MMSD has requested this variance that was approved by the US EPA August 30, 2019. An Alternative Mercury Effluent Limit (AMEL) was established at the calculated 1-day P99 of 3.4 ng/L. The permit requires MMSD to continue quarterly influent, field blank and effluent monitoring, maintain mercury discharge concentrations at or below 3.4 ng/L as a daily maximum and implement a Pollutant Minimization Program designed to minimize mercury influent to the plant with the ultimate goal of meeting the unvaried mercury limit.

WET – Whole effluent toxicity (WET) testing requirements and limits (if applicable) are determined in accordance with ss. NR 106.08 and NR 106.09, as revised August 2016. (See the current version of the Whole Effluent Toxicity Program Guidance Document and checklist and WET information, guidance and test methods at http://dnr.wi.gov/topic/wastewater/wet.html). The May 19, 2017 WQBEL memo recommends annual acute WET testing

and twice per year chronic WET testing. See subsection 3.2.1.14 in the permit for WET testing time frames and WET requirements for the discharge from Outfall 001 to Badfish Creek. Note that the May 19, 2017 WQBEL memo mistakenly states that the instream waste concentration (IWC) for Badfish Creek was 100%, based on stream flow of 0 cfs. The stream flow (7Q-10) used in the calculation of the IWC should have been the stream flow for the first non-variance water body downstream of the outfall. For outfall 001 this occurs where the classification of Badfish Creek becomes warm water sport fish at Hwy A. The stream flow at this point is actually 5.7 cfs and the calculated IWC is 93%. This change does not affect the recommendation for annual acute and twice per year chronic WET testing.

Toxics/Metals – Subsection NR 200.065(1)(b), Table 1, establishes minimum application monitoring requirements for discharges to surface waters. For a major municipal discharger that monitoring includes a Priority Pollutant scan (PPS) for toxic parameters, including metals. MMSD's permit also requires monthly monitoring for the metals cadmium, chromium, copper, lead, nickel and zinc. This monitoring is required because MMSD operates a local pretreatment program for the many industries that discharge to the treatment facility. The need for acute (daily maximum) and chronic (weekly and monthly average) limitations was evaluated in the WQBEL memo dated May 19, 2017. None of the toxics or metals were detected at levels that would trigger any limits.

Total Nitrogen Monitoring (Nitrite + Nitrate Nitrogen, Total Kjehldahl Nitrogen & Total Nitrogen) - Based on the "Guidance for Total Nitrogen Monitoring in WPDES Permits" dated October 2012, quarterly effluent monitoring for Total Nitrogen parameters is required for municipal majors discharging to the Mississippi River Basin.

6.2 Sample Point Number: 005- EFFL/BADGER MILL CREEK

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Continuous	Continuous	
CBOD5	Monthly Avg	16 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect November through April annually.
CBOD5	Monthly Avg	7.0 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect May through October annually.
CBOD5	Weekly Avg	16 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect November through April annually.
CBOD5	Weekly Avg	7.0 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect May through October annually.
Suspended Solids, Total	Monthly Avg	16 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect November through April annually.
Suspended Solids, Total	Monthly Avg	10 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect May through October annually.
Suspended Solids, Total	Weekly Avg	27 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect November through April annually.
Suspended Solids, Total	Weekly Avg	17 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect May through October annually.
Dissolved Oxygen	Daily Min	5.0 mg/L	Daily	Continuous	See subsection 3.2.3.2 in the permit for Compliance with Dissolved Oxygen

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					Limit.
pH Field	Daily Min	6.0 su	Daily	Grab	
pH Field	Daily Max	9.0 su	Daily	Grab	
Fecal Coliform	Geometric Mean - Monthly	400 #/100 ml	2/Week	Grab	Limit in effect May 1 through September 30 annually.
Fecal Coliform	Geometric Mean - Wkly	780 #/100 ml	2/Week	Grab	Limit in effect May 1 through September 30 annually.
Nitrogen, Ammonia (NH3-N) Total	Daily Max	11 mg/L	Daily	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	3.8 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect October through April annually.
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	1.1 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect May through September annually.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	8.7 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect October through April annually.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	2.6 mg/L	Daily	24-Hr Flow Prop Comp	Limit in effect May through September annually.
Phosphorus, Total	Monthly Avg	1.0 mg/L	Daily	24-Hr Flow Prop Comp	This is an interim limit. The final monthly average water quality based effluent limit is 0.225 mg/L. See subsections 3.2.3.3 through 3.2.3.5 in the permit for compliance options and 10.2 below for the phosphorus compliance schedule.
Phosphorus, Total	6-Month Avg	0.6 mg/L	Daily	24-Hr Flow Prop Comp	This is an interim limit effective starting May 1, 2020. The final 6-month average water quality based effluent limit is 0.075 mg/L. See subsection 3.2.1.6 in the permit for averaging periods and compliance determination.
Phosphorus, Total		lbs/day	Daily	Calculated	Calculate the mass discharge of phosphorus in lbs/day on the same days

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					phosphorus sampling occurs. The final 6-month average water quality based mass limit is 2.25 lbs/day and goes into effect per the phosphorus compliance schedule at subsection 6.4.
Chloride	Weekly Avg	465 mg/L	Daily	24-Hr Flow Prop Comp	This is an interim limit in effect November 1 through March 31. See subsections 3.2.3.6 in the permit for chloride source reduction measures and 10.12 below for the Chloride Target Value schedule.
Chloride	Weekly Avg	430 mg/L	Daily	24-Hr Flow Prop Comp	This is an interim limit in effect April 1 through October 31. See subsections 3.2.3.6 in the permit for chloride source reduction measures and 10.1.2 below for the Chloride Target Value schedule.
Chloride		lbs/day	Daily	Calculated	Calculate the daily mass discharge of chloride in lbs/day on the same days chloride sampling occurs.
Mercury, Total Recoverable	Daily Max	3.4 ng/L	Monthly	Grab	This is an Alternative Mercury Effluent Limit. See subsections 3.2.3.7 in the permit for Mercury Variance information, 3.2.3.8 for Mercury Monitoring requirements and 10.1.4 below for the mercury variance schedule.
Acute WET		TUa	See Listed Qtr(s)	24-Hr Time Prop Comp	See subsection 3.2.3.9 in the permit for whole effluent toxicity (WET) testing monitoring dates and WET requirements.
Chronic WET		TUc	See Listed	24-Hr Time	See subsection 3.2.3.9 in

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
			Qtr(s)	Prop Comp	the permit for whole effluent toxicity (WET) testing monitoring dates and WET requirements.
Temperature Maximum	Monthly Avg	57 deg F	3/Week	Continuous	Limit in effect January annually.
Temperature Maximum	Monthly Avg	69 deg F	3/Week	Continuous	Limit in effect October annually.
Temperature Maximum	Monthly Avg	65 deg F	3/Week	Continuous	Limit in effect November annually.
Temperature Maximum	Monthly Avg	62 deg F	3/Week	Continuous	Limit in effect December annually.
Nitrogen, Total Kjeldahl		mg/L	Quarterly	24-Hr Flow Prop Comp	Monitoring Only
Nitrogen, Nitrite + Nitrate Total		mg/L	Quarterly	24-Hr Flow Prop Comp	Monitoring Only
Nitrogen, Total		mg/L	Quarterly	Calculated	Monitoring Only

6.2.1 Changes from Previous Permit

Madison Metropolitan Sewerage District (MMSD) has requested and the Department has approved substituting $CBOD_5$ limits in the reissued permit in place of the BOD_5 limits in the current permit. Weekly average limits for $CBOD_5$ shall be the same as for BOD_5 in the current permit, namely 16 mg/L from November through April and 7.0 mg/L from May through October. Additionally, monthly average $CBOD_5$ limitations are now required and have been set equal to the weekly average limits and covering the same time frames. Since MMSD's current permit has monthly average total suspended solids (TSS) limits new rules require that weekly average limits also be calculated. Weekly average limitations of 27 mg/L for November through April and 17 mg/L for May through October will apply for the reissued permit. The reissued permit will have a new fecal coliform limit of 780 #/100 ml as a weekly geometric mean, effective May 1 through September 30 annually that is in addition to the current fecal coliform limit of 400 #/100 ml as a monthly geometric mean.

New phosphorus rules (ch. NR 217) now in effect statewide require water quality based effluent limits (WQBELs) for phosphorus. MMSD's final limits for total phosphorus for Outfall 005 to Badger Mill Creek shall be 0.075 mg/L (2.25 lbs/day) as a 6-month average and 0.225 mg/L as a monthly average and go into effect at the end of an extended phosphorus compliance schedule that allows up to 8 ½ years to comply with the total phosphorus WQBELs. A 1.0 mg/L monthly average TP limit will apply on the permit effective date and an adaptive management TP interim limit of 0.6 mg/L as a 6-month average will apply beginning November 2019. MMSD currently has an alternative phosphorus limit of 1.5 mg/L as a monthly average.

MMSD has applied for a continuation of a variance from the chronic water quality standard for chloride of 395 mg/L, that was approved by EPA August 30, 2019. MMSD will be required to maintain chloride effluent concentrations at or below interim (variance) limits of 465 mg/L for winter (November through March) and 430 mg/L for summer (April through October), implement an EPA-approved chloride source reduction measures plan and submit annual chloride reports per a Chloride Target Value schedule. MMSD has also applied for a continuation of a variance from the water

quality standard for mercury based on the wildlife criterion of 1.3 ng/L as a monthly average. This variance was approved by EPA on August 30, 2019. A daily maximum Alternative Mercury Effluent Limit (variance limit) of 3.4 ng/L will apply on the permit effective date, MMSD will be required to implement an approved mercury pollutant minimization program (PMP) plan and submit annual mercury progress reports per a Mercury PMP schedule. Subchapter VI of ch. NR 106 allows for alternative effluent limitations (AEL) for temperature. MMSD's request for temperature AELs for its discharge to Badger Mill Creek was approved by the Department on June 28, 2017. Monthly average temperature limitations of 57° F for January, 55° F for February and March, 58° F for April, 63° F for May, 65° F for June, 70° F for July, 71° F for August and September, 69° F for October, 64° F for November and 62° F for December will apply on the permit effective date. The reissued permit will require quarterly monitoring of total nitrogen parameters (total Kjeldahl nitrogen, nitrite + nitrate nitrogen and total nitrogen). New Class B and Class A sludge outfalls have been added.

6.2.2 Explanation of Limits and Monitoring Requirements

Water Quality Based Limits and WET Requirements and Disinfection

$CBOD_5$ – Madison Metropolitan Sewerage District (MMSD) requested that the Department evaluate the potential for $CBOD_5$ limits in place of the current BOD_5 limits. Based on the factors considered in the May 19, 2017 WQBEL memo the Department determined that $CBOD_5$ limits were appropriate. Weekly average limits for $CBOD_5$ in the reissued permit shall be set equal to the BOD_5 limits in the current permit, namely 16 mg/L from November through April and 7.0 mg/L from May through October. Additionally, recent revisions to ch. NR 106, regarding the expression of limits (effective September 1, 2016) require that monthly average $CBOD_5$ limitations also be included in the reissued permit and have been set equal to the weekly average limits and covering the same time frames.

Total Suspended Solids (TSS) – The current permit contains monthly average TSS limitations of 10 mg/L for May through October and 16 mg/L for November through April. These limits are being retained in the reissued permit. Additionally, recent revisions to ch. NR 106, regarding the expression of limits (effective September 1, 2016) require that whenever a monthly average limitation is determined necessary to protect water quality, a weekly average limit shall be calculated using procedures specified in s. NR 106.07(3)(e)4. The calculated TSS weekly average limitations for the reissued permit shall equal 27 mg/L for November through April and 17 mg/L for May through October. See the May 19, 2017 WQBEL memo for the detailed calculations.

Dissolved Oxygen (DO) – The existing limitation of 5.0 mg/L as a daily minimum shall remain unchanged. See subsection 3.2.2.2 in the permit for determining compliance with the DO limit. DO is monitored continuously with results being record at 1-minute intervals. The hourly average result is reported. This modification corrected the sample type from grab to continuous.

pH – The categorical pH limits of 6.0 s.u. (standard pH units) as a daily minimum and 9.0 s.u. as a daily maximum are being retained unchanged.

Disinfection – Disinfection is required May 1 through September 30 annually and is accomplished using ultra-violet (UV) light mechanism.

Fecal Coliforms – The current permit has a fecal coliforms limit of 400 #/100 ml as a monthly geometric mean effective May 1 through September 30 that is being retained in the reissued permit. Due to recent revisions to ch. NR 106 (effective September 1, 2016) regarding expression of limits, whenever a monthly average limitation is determined necessary to protect water quality, a weekly average limit shall be calculated using procedures specified in s. NR 106.07(3)(e)4. Based on these calculations a fecal coliforms limit of 780 #/100 ml as a weekly geometric mean shall be included in the proposed permit effective May 1 through September 30.

Ammonia – Monthly and weekly average ammonia limits were not re-evaluated in the May 19, 2017 WQBEL memo because there have been no changes in the effluent and receiving water flows. The existing limitations shall be carried over into the reissued permit. Daily maximum ammonia limits may be based on the receiving water classification and effluent pH at the time of discharge using the two times acute toxicity criterion (2xATC) approach. Recent revisions to ch. NR 106, outline the option for using the 1-Q_{10} receiving water low flow and the conservation of mass equation at s.

NR 106.06(4)(b), to calculate acute limitations. In MMSD's case, the existing daily maximum limit of 11 mg/L is more stringent than the daily maximum limits calculated using either the 2xATC or 1-Q_{10} approaches and will be retained in the permit due to antibacksliding/antidegradation rules (ch. NR 207).

Phosphorus – Recent revisions to the administrative rules for phosphorus discharges took effect on December 1, 2010. Details may be found at: http://dnr.wi.gov/topic/surfacewater/phosphorus.html. The new phosphorus rules are contained in s. NR 102.06 and ch. NR 217, Subchapter III. The final water quality based effluent limitations for MMSD's Outfall 005 to Badger Mill Creek are a 6-month seasonal average limit of 0.075 mg/L (2.25 lbs/day) and a monthly average limit of 0.225 mg/L. The averaging periods for the six-month seasonal average limit are May through October and November through April. For the reasons explained in the April 30, 2012 paper entitled 'Justification for Use of Monthly, Growing Season and Annual Average Periods for Expression of WPDES Permit Limits for Phosphorus Discharges in Wisconsin', WDNR has determined that it is impracticable to express the phosphorus WQBEL for the permittee as daily maximum or weekly average values. The final effluent concentration limits for phosphorus are expressed as a monthly average and a 6-month seasonal average. The MMSD treatment facility utilizes biological phosphorus removal; however, the facility is still unable to meet the stringent phosphorus WQBELS immediately based on existing operation. Therefore, a schedule of compliance is appropriate and necessary pursuant to s. NR 217.17. MMSD must comply with the phosphorus WQBELs at Outfall 005 at the end of the phosphorus compliance schedule that takes place over an 8 ½ year time period. This compliance schedule will result in compliance as soon as possible. A lengthy compliance schedule has been included because the permittee will need a significant amount of time to meet the stringent phosphorus WQBELs contained in the permit using tertiary filtration or a similar phosphorus removal technology. Please see compliance schedule specifics in the Schedules subsection at 10.2 below with further discussion at subsection 10.2.1. Because a phosphorus compliance schedule is being granted, an interim phosphorus limit must be included in the permit based on current effluent quality to prevent further impairment of the receiving water. A 1.0 mg/L monthly average TP limit will apply on the permit effective date and an adaptive management TP interim limit of 0.6 mg/L as a 6-month average will apply beginning the period from May 1, 2020 through October 31, 2020. MMSD currently has an alternative phosphorus limit of 1.5 mg/L as a monthly average.

Note that there was an error in the May 19, 2017 WQBEL memo used for this permit reissuance. The phosphorus mass limit of 2.25 lbs/day in the memo's recommendations for Outfall 005 was identified as a monthly average. However, phosphorus mass limits are expressed as 6-month seasonal average limits.

Chloride – MMSD has applied for a variance from the chronic water quality criterion for chloride of 395 mg/L. The effluent discharged from Outfall 005 to Badger Mill Creek is exactly the same as the effluent discharged from Outfall 001 to Badfish Creek. Therefore, the chloride discussion in subsection 7.1.4 above applies to both outfalls.

Mercury – MMSD has applied for a variance from the wildlife criterion for mercury of 1.3 ng/L as a monthly average. The effluent discharged from Outfall 005 to Badger Mill Creek is exactly the same as the effluent discharged from Outfall 001 to Badfish Creek. Therefore, the mercury discussion in subsection 7.1.4 above applies to both outfalls.

WET – Whole effluent toxicity (WET) testing requirements and limits (if applicable) are determined in accordance with ss. NR 106.08 and NR 106.09, as revised August 2016. (See the current version of the Whole Effluent Toxicity Program Guidance Document and checklist and WET information, guidance and test methods at http://dnr.wi.gov/topic/wastewater/wet.html). The May 19, 2017 WQBEL memo recommends annual acute WET testing and twice per year chronic WET testing. See subsection 3.2.3.9 in the permit for WET testing time frames and WET requirements for the discharge from Outfall 005 to Badger Mill Creek. Note that the May 19, 2017 WQBEL memo mistakenly states that the instream waste concentration (IWC) for Badger Mill Creek was 100%, based on stream flow of < 0.01 cfs. The stream flow (7Q-10) used in the calculation of the IWC should have been the stream flow for the first non-variance water body downstream of the outfall. For outfall 005 this occurs where the classification of Badger Mill Creek becomes Cold Water Category 5 at Hwy 69. The stream flow at this point is actually 0.18 cfs and the calculated IWC is 97%. This change does not affect the recommendation for annual acute and twice per year chronic WET testing.

Temperature – Requirements for Temperature are included in s. NR 102 Subchapter II Water Quality Standards for Temperature and NR 106 Subchapter V Effluent Limitations for Temperature. These regulations became effective October 1, 2010. Details can be found at: http://dnr.wi.gov/topic/SurfaceWater/thermal.html. These revisions establish

the criteria needed to calculate thermal limits. Three times per week monitoring of maximum effluent temperature is required upon the permit effective date. Based on a comparison of the weekly average and daily maximum limitations and effluent quality, weekly average temperature limits are apparently necessary for the months of January (54° F), October (63° F), November and January (both 54° F). However, MMSD has submitted an *Alternative Effluent Limitations (AEL) for Temperature for a Discharge to Badger Mill Creek* request to the Department. Subchapter VI of Ch. NR 106 allows for alternative effluent limitations (AEL) for temperature to "…be established by the department if the owner or operator [MMSD] of a point source demonstrates to the department that a proposed effluent limitation established under subch. V is more stringent than necessary to assure the protection and propagation of a balanced indigenous population of shellfish, fish and wildlife in and on the body of water into which the discharge is made (s. NR 106.70). Using historical fisheries data, MMSD made the case that no appreciable harm has occurred to the representative important species, mottled sculpin (native) and brown trout (introduced) as a result of the discharge. See the AEL approval package for MMSD's request that is attached to this fact sheet for more details. The following monthly average AEL temperature limitations shall be included in the reissued permit: 57° F for January, 69° F for October, 64° F for November and 62° F for December. These limits will apply on the permit effective date. Note that AEL demonstrations must be re-evaluated for each permit reissuance.

6.3 Sample Point Number: 016- PS6 Flapgate; 017- PS7 Stoplog; 018- PS8 Stoplog; 019- SEI Upstream of PS9; 020- PS11 Flapgate, and 021- Flapgate Upstream of PS13

Monitoring Requirements					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Volume		MGD	Per Occurrence	Estimated	
Fecal Coliform		#/100 ml	Per Occurrence	Grab	

6.3.1 Changes from Previous Permit

Sample points 016 through 021 have been added for tracking potential sanitary sewer overflows (SSOs) from six automatic overflow structures located throughout the Madison Metropolitan Sewerage District's sanitary sewage collection system. See subsection 4 'Sample Points' above for descriptions of the overflow structures, the location of these structures and the bodies of water that could receive discharges of untreated flows.

6.3.2 Explanation of Monitoring Requirements

These sample points are intended to track any discharge of untreated wastewater through any of the six overflow structures, which are deemed Sanitary Sewer Overflows ('SSO') and are prohibited. In addition to the 'Volume' and 'Fecal Coliform' monitoring requirements shown above, the permittee shall report any discharges through any of the six overflow structures as required by subsection 7.3.1 'Sanitary Sewage Overflow' of the permit.

The estimated 'Volume' of the overflow and results of 'Fecal Coliform' monitoring are to be reported on the Discharge Monitoring Reports.

7 Land Treatment – Proposed Monitoring and Limitations

7.1 Sample Point Number: 008- Golf Course Spray Irrigation

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		Gal	Daily	Total Daily	
Hydraulic Application Rate	Monthly Avg	10,000 gal/ac/day	Monthly	Calculated	
$CBOD_5$	Monthly Avg	16 mg/L	Monthly	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	Monthly	24-Hr Flow Prop Comp	
pH Field		Su	Monthly	Grab	
Nitrogen, Total Kjeldahl		mg/L	Monthly	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total		mg/L	Monthly	24-Hr Flow Prop Comp	
Nitrogen, Organic Total		mg/L	Monthly	Calculated	
Nitrogen, Nitrite + Nitrate Total		mg/L	Monthly	24-Hr Flow Prop Comp	
Nitrogen, Total		mg/L	Monthly	Calculated	
Chloride		mg/L	Monthly	24-Hr Flow Prop Comp	
Solids, Total Dissolved		mg/L	Monthly	24-Hr Flow Prop Comp	
Nitrogen, Max Applied On Any Zone		lbs/ac/yr	Annual	Total Annual	
Fecal Coliform		#/100 ml	2/Week	Grab	
Phosphorus, Total		mg/L	Daily	24-Hr Flow Prop Comp	

7.1.1 Changes from Previous Permit:

BOD_5, Total monitoring replaced with $CBOD_5$ monitoring. The Maximum Applied Volume of effluent is now limited to 1.4 Inches/Load Cycle. Total Nitrogen per Zone is limited to 217 Pounds/Acre/Year; the Land Treatment Management Plan may be used to justify a higher limit.

7.1.2 Explanation of Limits and Monitoring Requirements

Requirements for land treatment of municipal wastewater are determined in accordance with ch. NR 206. The maximum applied volume per load cycle is based on s. NR 110.255(2)3, Table 8, for a soil type of silt loam.

8 Land Application - Proposed Monitoring and Limitations

Municipal Sludge Description						
Sample Point	**Sludge Class (A or B)**	**Sludge Type (Liquid or Cake)**	**Pathogen Reduction Method**	**Vector Attraction Method**	**Reuse Option**	**Amount Reused/Disposed (Dry Tons/Year)**
002	B	Liquid	Fecal Coliform or Mesophilic Anaerobic Digestion	Injection	Land Application	7,800 dry US tons (Permit Application)
024	B	Cake	Fecal Coliform or Mesophilic Anaerobic Digestion	Incorporation	Land Application	New Sample Point (Outfall)
025	B	Composted Cake	Fecal Coliform or Mesophilic Anaerobic Digestion	Incorporation	Land Application	New Sample Point (Outfall)
026	B	Liquid	Fecal Coliform or Mesophilic Anaerobic Digestion	Injection	Land Application	New Sample Point (Outfall)
011	A	Cake	Fecal Coliform and Temp/Time (thermophilic digestion)	Volatile Solids Reduction	Exceptional Quality Bulk	780 dry US tons (Permit Application)
013	A	Composted Cake	Fecal Coliform and Temp/Time (thermophilic digestion)	Volatile Solids Reduction	Exceptional Quality Sludge or Exceptional Quality Bulk	New Sample Point (Outfall)
023	A	Composted Cake	Fecal Coliform AND Either Temp/Time or Class A Compost Requirements pending feedstocks	Volatile Solids Reduction or Aerobic Process	Exceptional Quality Sludge or Exceptional Quality Bulk	New Sample Point (Outfall)
022	A	Liquid	Fecal Coliform and Temp/Time	Volatile Solids Reduction	Not Applicable Sample Point	Sample Point Only, Not an Outfall

Municipal Sludge Description						
Sample Point	**Sludge Class (A or B)**	**Sludge Type (Liquid or Cake)**	**Pathogen Reduction Method**	**Vector Attraction Method**	**Reuse Option**	**Amount Reused/Disposed (Dry Tons/Year)**
					Only	
012	Struvite	Solid	N/A	N/A	Hauled Away	New Sample Point (Outfall)
Does sludge management demonstrate compliance? **Yes**						
Is additional sludge storage required? **No**						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? **No**. If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in landapplying sludge from this facility.						
Is a priority pollutant scan required? **Yes**. A priority pollutant scan (PPS) of sample point 002 shall be performed in calendar year 2021. Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

8.1 Sample Point Numbers: 002 - Class B Anaerobically Digested Liquid; 024 - Class B Anaerobically Digested Cake; 025 - Class B Composted Cake; 026 – Off-Site Storage

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	1/ 2 Months	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	1/ 2 Months	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	1/ 2 Months	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	1/ 2 Months	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	1/ 2 Months	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	1/ 2 Months	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	1/ 2 Months	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	1/ 2 Months	Composite	
Lead Dry Wt	High Quality	300 mg/kg	1/ 2 Months	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	1/ 2 Months	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	1/ 2 Months	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Molybdenum Dry Wt	Ceiling	75 mg/kg	1/ 2 Months	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	1/ 2 Months	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	1/ 2 Months	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	1/ 2 Months	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	1/ 2 Months	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	1/ 2 Months	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	1/ 2 Months	Composite	
Nitrogen, Total Kjeldahl		Percent	1/ 2 Months	Composite	
Nitrogen, Ammonium (NH_4-N) Total		Percent	1/ 2 Months	Composite	
Phosphorus, Total		Percent	1/ 2 Months	Composite	
Phosphorus, Water Extractable		% of Tot P	1/ 2 Months	Composite	
Potassium, Total Recoverable		Percent	1/ 2 Months	Composite	
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	PCB monitoring requirements only apply to Sampling Point (Outfall) 002. Sample in 2021as part of Priority Pollutant Scan.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	PCB monitoring requirements only apply to Sampling Point (Outfall) 002. Sample in 2021as part of Priority Pollutant Scan.
Municipal Sludge Priority Pollutant Scan			Once	Composite	Priority Pollutant Scan monitoring requirements only apply to Sampling Point (Outfall 002). As specified in ch. NR 215.03 (1-4), Wis. Adm. Code. Sample in 2021.

8.2 Sampling Point (Outfall) 011- Class A Centrifuged Anaerobic Cake Storage

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	1/ 2 Months	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	1/ 2 Months	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	1/ 2 Months	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	1/ 2 Months	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	1/ 2 Months	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	1/ 2 Months	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	1/ 2 Months	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	1/ 2 Months	Composite	
Lead Dry Wt	High Quality	300 mg/kg	1/ 2 Months	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	1/ 2 Months	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	1/ 2 Months	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	1/ 2 Months	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	1/ 2 Months	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	1/ 2 Months	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	1/ 2 Months	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	1/ 2 Months	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	1/ 2 Months	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	1/ 2 Months	Composite	
Nitrogen, Total Kjeldahl		Percent	1/ 2 Months	Composite	
Nitrogen, Ammonium (NH_4-N) Total		Percent	1/ 2 Months	Composite	
Phosphorus, Total		Percent	1/ 2 Months	Composite	
Phosphorus, Water Extractable		% of Tot P	1/ 2 Months	Composite	
Potassium, Total Recoverable		Percent	1/ 2 Months	Composite	

8.3 Sampling Point (Outfall) 013 - Class A Composted Cake

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Fecal Coliform		MPN/g TS	Annual	Composite	
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH_4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	

8.4 Sampling Point (Outfall) 023 - Class A Composted Cake

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	1/ 2 Months	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	1/ 2 Months	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	1/ 2 Months	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	1/ 2 Months	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	1/ 2 Months	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	1/ 2 Months	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	1/ 2 Months	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	1/ 2 Months	Composite	
Lead Dry Wt	High Quality	300 mg/kg	1/ 2 Months	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	1/ 2 Months	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	1/ 2 Months	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	1/ 2 Months	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	1/ 2 Months	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	1/ 2 Months	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	1/ 2 Months	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	1/ 2 Months	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	1/ 2 Months	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	1/ 2 Months	Composite	
Nitrogen, Total Kjeldahl		Percent	1/ 2 Months	Composite	
Nitrogen, Ammonium (NH_4-N) Total		Percent	1/ 2 Months	Composite	
Phosphorus, Total		Percent	1/ 2 Months	Composite	
Phosphorus, Water Extractable		% of Tot P	1/ 2 Months	Composite	
Potassium, Total Recoverable		Percent	1/ 2 Months	Composite	

8.5 Sampling Point 022 – Class A Thermophilic Digested Liquid

This sampling point is included for MMSD to report the results of bi-monthly monitoring for List 3, methods for Pathogen Control for Class A Sludge. Per s. NR 204.07(6)(a)1, Wis. Adm. Code the required fecal coliform density or salmonella

density shall be satisfied immediately after the Class A treatment process. This is a sample point for List 3 monitoring only and is not an outfall from which the Class A sludge is discharged for land application.

8.6 Changes from Previous Permit:

Class B Biosolids Sample Point Outfalls: Sample point numbers 024 - Class B Anaerobically Digested Cake, 025 - Class B Composted Cake, and 026 – Off-Site Storage are new for this permit term. The time frame for conducting a priority pollutant scan and PCB monitoring on existing sample point 002 - Class B Anaerobically Digested Liquid is now calendar year 2021.

Class A Biosolids Sample Point Outfalls: Sample point numbers 011- Class A Centrifuged Anaerobic Cake Storage, 013 - Class A Composted Cake, 023 - Class A Composted Cake and 022 – Class A Thermophilic Digested Liquid are new for this permit term. Outfall 011 serves the same purpose and is subject to the same monitoring requirements as Outfall 010 in the current permit.

8.7 Explanation of Limits and Monitoring Requirements

Requirements for land application of municipal sludge are determined in accordance with ch. NR 204. Ceiling and high quality limits for metals in sludge are specified in s. NR 204.07(5). Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07(7) for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k).

MMSD requested additional flexibility in their permit after the permit was public noticed. Most recently, MMSD has been unable to access fields to land apply their liquid sludge as a result of wet conditions in the spring and the fall. These wet conditions have impacted the ability to store sludge. MMSD requested to add dewatering and composting capabilities for providing continued Class B sludge dispersal and treatment options. Two additional Class B Sludge sample points/outfalls, 024 and 025, were added to the WPDES permit. These outfalls maintain the same requirements as sample point 002, which was public noticed. No changes to the Class B requirements were made. Additionally, the composting requirements were clarified if additional sludge feedstocks were to be utilized. Monitoring at outfalls 024 and 025 is only required when the outfalls are active.

All biosolids storage prior to this modification was on site at the WWTP. In the summer of 2020, Madison Met submitted a request for approval of an off-site biosolids storage structure. This storage is an above ground concrete manure storage unit, with an allowable capacity of 2.9 MG, located in the NW ¼, SE ¼, Section 24, T06N, R08E. A no objection letter to this off-site storage unit was sent to Madison Met on October 1, 2020. Biosolids will be transferred from the WWTP to the off-site storage unit prior to land application on nearby approved fields. Sample requirements are the same as the other permitted Class B sample points/outfalls (002, 024 & 025).

Class A sample point/outfall 023 was added to MMSD's permit to provide easier reporting and clarify MMSD requirements for treatment processes previously public noticed for sample point 013. This sample point/outfall (023) maintains the same requirements as sample point 013. Additionally, clarifications to Class A composting requirements were added. Sample point/outfall 022 is included in the permit so MMSD can report the results of required fecal coliform density or salmonella density monitoring, which shall be satisfied immediately after the Class A treatment process. Sample point 022 is designated for reporting Pathogen Control for Class A Sludge only; it is not an outfall from which sludge will be discharged for land application. Monitoring at outfall 023 is only required when the outfall is active.

Sample point number 013 is designated to track the monitoring and distribution of the Composted Class A Cake Sludge through s. NR 204.09 Alternative Use of Sludge, Wis. Adm. Code. Approval was sent to MMSD on August 16, 2018. This sample point currently covers the pilot composting operation that was approved for 35 cubic yards/yr. Distribution of additional compost will be subject to department review. As the pilot project progresses, metals monitoring may be waived with department approval where feedstocks are known.

Additionally, Class B Sludge - Vector Control: Incorporation was added to the permit at section 7.7.19 of Standard Requirements to provide additional clarity and flexibility. MMSD is not required to use incorporation to meet vector

control. Sections 7.7.15 and 7.7.16 of the Standard Requirements related to Class A and Class B composting requirements were added.

8.8 Sample Point Number: 012- Struvite Harvesting

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Weight		tons/yr	Annual	Total Annual	Report the tons of product produced by the Ostara process per year.

8.8.1 Changes from Previous Permit & Explanation of Monitoring Requirements

The current permit did not track Struvite Harvesting through the electronic discharge monitoring reports (eDMRs). The total tons of product distributed was previously provided by MMSD in an annual report but will now be reported electronically.

9 Schedules

9.1 Watershed Adaptive Management Option Annual Report Submittals

The permittee shall submit annual reports on the implementation of AM plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) as specified in subsections 3.2.1.7 and 3.2.1.8 and the following schedule.

Required Action	Due Date
Annual Adaptive Management Report: Submit an annual adaptive management report. The annual adaptive management report shall: o Identify those actions from section 3 of the approved adaptive management plan that were completed during the previous calendar year and those actions that are in progress; o Evaluate collected monitoring data; o Document progress in achieving the goals and measures identified in the approved adaptive management plan; o Describe the outreach and education efforts that occurred during the past calendar year; o Identify any corrections or adjustments to the adaptive management plan that are needed to achieve compliance with the phosphorus water quality standards specified in s. NR 102.06, Wis. Adm. Code; o Describe any updates needed to Madison Metropolitan Sewerage District's approved phosphorus optimization plan; o Submit results from all sample points outlined in AM plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) to the Department using the Department's Laboratory Data Entry System (LDES); and o Submit all biomonitoring results from all locations outlined in AM plan WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) to the Department using the Department's Laboratory Data Entry System (LDES).	10/31/2020
Annual Adaptive Management Report #2: Submit an Adaptive Management progress report as	07/31/2021

defined above.	
Annual Adaptive Management Report #3: Submit an Adaptive Management progress report as defined above.	07/31/2022
Annual Adaptive Management Report #4: Submit an Adaptive Management report as defined above.	07/31/2023
Final Adaptive Management Report for 1st Permit Term: Submit the final Adaptive Management (AM) report documenting progress made during the first permit term under AM in meeting the watershed phosphorus reduction target of 52,648 lbs/yr, as well as the anticipated future reductions in phosphorus sources and phosphorus effluent concentrations, which shall be measured in accordance with the AM Plan modeling protocols. The report shall summarize AM activities that have been implemented during the current permit term and state which, if any, actions from the approved AM plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) were not pursued and why. The report shall include an analysis of trends on both a monthly and six-month average basis for concentrations and mass effluent discharged. Additionally, for informational purposes, there shall be an analysis of any improvements to the quality of surface waters in the Adaptive Management Action Area focusing on phosphorus and flow results collected during the permit term. The surface water analysis shall evaluate how the in-stream loadings have changed over the permit term in comparison to implemented AM actions.	07/31/2024
Renewal of Adaptive Management Plan for Permit Reissuance: If the permittee intends to seek renewal of AM plan No. WQT-2017-003 (January 2017) and Amendment 1 (February 2018) per s. NR 217.18, Wis. Adm. Code, for the reissued permit term, proposed AM goals and actions based on an updated AM plan shall be submitted to the Department for review and approval. The permittee may propose to adjust load reductions required by AM plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) either up or down at the beginning of each WPDES permit term to reflect changes in loads associated with point and non-point sources. This schedule may be modified to incorporate any changes in AM goals and actions, removed if the AM program is terminated per section 3.2.1.9, or removed if the adaptive management plan is has achieved water quality standards as determined by the Department within the AM action area.	09/30/2024
Comply with Adaptive Management Interim Limit: For the second permit term under Adaptive Management the permittee shall comply with an Adaptive Management total phosphorus interim limit no higher than 0.5 mg/L as a 6-month average, in addition to the 1.0 mg/L monthly avg already effective.	04/01/2025
Annual Adaptive Management Report #5: Submit an Adaptive Management progress report as defined above.	07/31/2025
Annual Adaptive Management Report #6: Submit an Adaptive Management progress report as defined above.	07/31/2026
Annual Adaptive Management Report #7: Submit an Adaptive Management report as defined above.	07/31/2027
Annual Adaptive Management Report #8: Submit an Adaptive Management report as defined above.	07/31/2028
Final Adaptive Management Report for 2nd Permit Term: Submit the final Adaptive Management (AM) report documenting progress made during the second permit term under AM in meeting the watershed phosphorus reduction target of 76,579 lbs/yr, as well as the anticipated future reductions in phosphorus sources and phosphorus effluent concentrations, which shall be measured in accordance with the AM Plan modeling protocols. The report shall summarize AM activities that	07/31/2029

have been implemented during the current permit term and state which, if any, actions from the approved AM plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) were not pursued and why. The report shall include an analysis of trends on both a monthly and six-month average basis for concentrations and mass effluent discharged. Additionally, for informational purposes, there shall be an analysis of any improvements to the quality of surface waters in the Adaptive Management Action Area focusing on phosphorus and flow results collected during the permit term. The surface water analysis shall evaluate how the in-stream loadings have changed over the permit term in comparison to implemented AM actions.	
Renewal of Adaptive Management Plan for Permit Reissuance: If the permittee intends to seek renewal of AM plan No. WQT-2017-003 (January 2017) and Amendment 1 (February 2018) per s. NR 217.18, Wis. Adm. Code, for the reissued permit term, proposed AM goals and actions based on an updated AM plan shall be submitted to the Department for review and approval. The permittee may propose to adjust load reductions required by AM plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) either up or down at the beginning of each WPDES permit term to reflect changes in loads associated with point and non-point sources. This schedule may be modified to incorporate any changes in AM goals and actions, removed if the AM program is terminated per section 3.2.1.9, or removed if the adaptive management plan is has achieved water quality standards as determined by the Department within the AM action area.	
Annual Adaptive Management Report #9: Submit an Adaptive Management report as defined above.	07/31/2030
Annual Adaptive Management Report #10: Submit an Adaptive Management report as defined above.	07/31/2031
Annual Adaptive Management Report #11: Submit an Adaptive Management report as defined above.	07/31/2032
Annual Adaptive Management Report #12: Submit an Adaptive Management report as defined above.	07/31/2033
Final Adaptive Management Report: Submit the final Adaptive Management (AM) report documenting progress made throughout the AM project in meeting the watershed phosphorus reduction target of 95,724 lbs/yr, and in stream water quality standards specified in s. NR 102.06, Wis. Adm. Code. The report shall summarize AM activities that have been implemented during the current permit term and state which, if any, actions from the approved AM plan No. WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) were not pursued and why. The report shall include an analysis of trends on both a monthly and six-month average basis for concentrations and mass effluent discharged. Additionally, there should be an analysis of any improvements to the quality of surface waters in the Adaptive Management Action Area focusing on phosphorus and flow results collected during the permit term. The surface water analysis shall evaluate how the in-stream loadings have changed over the permit term in comparison to implemented AM actions.	07/31/2034
Achieve Water Quality Standards and Adaptive Management Plan Success: All the receiving waters identified within the AM plan WQT-2017-0003 (January 2017) and Amendment 1 (February 2018) shall be measured for success in accordance with part IV of the AM Plan. Compliance may be demonstrated using effluent data and watershed modeling that uses similar assumptions as the TMDL to demonstrate that the sum total of the allocations have been achieved for each reach. If some, but not all, reaches are complying with the allocations of the TMDL, only those point sources in the complying reaches will be considered in compliance at the end of the adaptive management period. The permittee shall continue to comply with applicable effluent limits (required under s. NR 217.18(3)(e)3, Wis. Adm. Code, expressed as a 6-month avg and 1.0 mg/L monthly avg) and continue monitoring of surface waters (stream reaches 62-69 per WQT-2017-0003 (January 2017)	03/31/2035

and Amendment 1 (February 2018)) at a minimum of monthly May through October for total phosphorus. If the allocations in the TMDL have been achieved but the applicable phosphorus water quality criterion in s. NR 102.06, Wis. Adm. Code has not been achieved in the reach for MMSD's outfall to Badfish Creek, consistent with s. 283.13(5), Wis. Stats. and Clean Water Act section 301(b)(1)(C), further evaluation and additional actions will be necessary in the next reissued permit as necessary to achieve phosphorus water quality criterion. (e.g., DNR reevaluation of TMDL allocations, imposition of more stringent limits, etc.).	

9.1.1 Explanation of Watershed Adaptive Management Option Annual Report Submittals Schedule

This implementation schedule applies only to Outfall 001 to Badfish Creek. This schedule requires MMSD to submit annual adaptive management (AM) annual reports that show progress towards meeting the goals and measures contained in the approved AM plan No. WQT-2017-0003 (January 2017) and Amendment 1 (2018). The Final Adaptive Management Report for 1st Permit Term must document the success of meeting the watershed phosphorus minimum reduction target of 4,625 lbs/yr, for MMSD and an overall project reduction of 5,329 lbs/yr, which is the combination of all four point sources (MMSD, Village of Oregon, City of Stoughton and Wisconsin DNR Nevin Fish Hatchery) participating in the AM project. This schedule contains the required actions as described in s. NR 217.18, Wis. Adm. Code, related to milestones for adaptive management interim phosphorus effluent limits, including effective dates, required actions in the schedule related to renewal of the adaptive management plan for permit reissuance and a final milestone for the permittee to achieve water quality standards and adaptive management plan success. The schedule covers the entire three permit terms (15 years) of the adaptive management project. Compliance with the phosphorus in-stream water quality standard in s. NR 102.06, Wis. Adm. Code, may be obtained at an earlier date. Future implementation schedules will be dependent on the success and progress of the AM plan to date and reevaluated each permit reissuance. The Schedule may be modified or removed should compliance be attained at an earlier date. The schedule may also be modified at permit reissuance should new information be submitted.

9.2 Chloride Target Value

As a condition of the variance to the water quality based effluent limitation(s) for chloride granted in accordance with s. NR 106.83(2), Wis. Adm. Code, the permittee shall perform the following actions.

Required Action	Due Date
Annual Chloride Progress Report: Submit an annual chloride progress report. The annual chloride progress report shall: Indicate which chloride source reduction measures or activities in the approved Source Reduction Plan have been implemented; Include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data; and Include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride such as loads from industries or road salt intrusion into the collection system. Note that the interim limitations of 465 mg/L for November 1 through March 31 annually and 430 mg/L for April 1 through October 31 annually remain enforceable until new enforceable limits are established in the next permit issuance. The first annual chloride progress report is to be submitted by the Date Due.	01/31/2021
Annual Chloride Progress Report #2: Submit the chloride progress report as defined above.	01/31/2022
Annual Chloride Progress Report #3: Submit the chloride progress report as defined above.	01/31/2023

Annual Chloride Progress Report #4: Submit the chloride progress report as defined above.	01/31/2024
Final Chloride Report: Submit the final chloride report documenting the success in meeting the chloride target value of 419 mg/L, as well as the anticipated future reduction in chloride sources and chloride effluent concentrations. The report shall summarize chloride source reduction measures that have been implemented during the current permit term and state which, if any, source reduction measures from the approved Source Reduction Plan were not pursued and why. The report shall include an analysis of trends in weekly, monthly and annual average chloride concentrations and total mass discharge of chloride based on chloride sampling and flow data covering the current permit term. The report shall also include an analysis of how influent and effluent chloride varies with time and with significant loadings of chloride such as loads from industries or road salt intrusion into the collection system. Additionally the report shall include proposed target values and source reduction measures for negotiations with the department if the permittee intends to seek a renewed chloride variance per s. NR 106.83, Wis. Adm. Code, for the reissued permit. Note that the target value is the benchmark for evaluating the effectiveness of the chloride source reduction measures, but is not an enforceable limitation under the terms of this permit.	09/30/2024
Annual Chloride Reports After Permit Expiration: In the event that this permit is not reissued on time, the permittee shall continue to submit annual chloride reports each year covering source reduction measures implemented and chloride concentration and mass discharge trends.	

9.2.1 Explanation of Chloride Target Value Schedule

As noted in the chloride discussion in subsection 7.1.3 above, chloride concentrations discharged from the MMSD treatment plant are above the chronic (weekly average) chloride limit of 395 mg/L, so a chloride limit of 395 mg/L would normally be required in the reissued permit for both Outfall 001 to Badfish Creek and Outfall 005 to Badger Mill Creek (the effluents discharged through these outfalls is identical). Additionally, mass limits of 165,000 lbs/day would apply for Outfall 001 and 11,900 lbs/day for Outfall 005. Chloride discharges are regulated under Subchapter VII of NR 106, and ss. NR 106.83(2)(a)—(d), provides for a variance from chloride limits if the permittee submits a chloride variance application and a Source Reduction Measures (SRM) plan that is approved by the U.S. Environmental Protection Agency (EPA). The permittee and Department must come to an agreement on an interim limit that applies on the permit effective date and a chloride target value that the permittee will strive to meet after implementing its SRM Plan throughout the permit term. The permittee shall also submit annual reports of progress on the implementation of the chloride SRM Plan, the contents of which are delineated in the Chloride Target Value Schedule above. MMSD will have seasonal (winter and summer) chloride interim limits of 465 mg/L for November 1 through March 31 and 430 mg/L for April 1 through October 31 that will apply for this permit reissuance. There will also be target value of 419 mg/L that MMSD will strive to meet by the permit's expiration date. EPA approved this variance on August 30, 2019.

9.3 Mercury Pollutant Minimization Program

As a condition of the variance to the water quality based effluent limitation(s) for mercury granted in accordance with s. NR 106.145(6), Wis. Adm. Code, the permittee shall perform the following actions.

Required Action	Due Date
Annual Mercury Progress Reports: Submit an annual mercury progress report. The annual mercury progress report shall: Indicate which mercury pollutant minimization activities or activities outlined in the approved Pollutant Minimization Plan have been implemented; Include an analysis of trends in monthly and annual total effluent mercury concentrations based on	01/31/2021

mercury sampling; and Include an analysis of how influent and effluent mercury varies with time and with significant loading of mercury such as loads from industries into the collection system. The first annual mercury progress report is to be submitted by the Due Date.	
Annual Mercury Progress Report #2: Submit a mercury progress report as defined above.	01/31/2022
Annual Mercury Progress Report #3: Submit a mercury progress report as defined above.	01/31/2023
Annual Mercury Progress Report #4: Submit a mercury progress report as defined above.	01/31/2024
Final Mercury Report: Submit a final report documenting the success in reducing mercury concentrations in the effluent, as well as the anticipated future reduction in mercury sources and mercury effluent concentrations. The report shall summarize mercury pollutant minimization activities that have been implemented during the current permit term and state which, if any, pollutant minimization activities from the approved pollutant minimization plan were not pursued and why. The report shall include an analysis of trends in monthly and annual total effluent mercury concentrations based on mercury sampling during the current permit term. The report shall also include an analysis of how influent and effluent mercury varies with time and with significant loading of mercury such as loads from industries into the collection system. If the permittee intends to re-apply for a mercury variance per s. NR 106.145, Wis. Adm. Code, for the reissued permit, a detailed pollutant minimization plan outlining the pollutant minimization activities proposed for the upcoming permit term should be submitted along with the final report.	09/30/2024
Annual Mercury Reports After Permit Expiration: In the event that this permit is not reissued on time, the permittee shall continue to submit annual mercury reports each year covering pollutant minimization activities implemented and mercury concentration trends.	

9.3.1 Explanation of Mercury Pollutant Minimization Program Schedule

MMSD has applied for a variance from the mercury water quality criterion for the protection of wildlife (1.3 ng/L). This variance was approved by EPA on August 30, 2019 and will cover both Outfall 001 to Badfish Creek and Outfall 005 to Badger Mill Creek. As conditions of receiving a mercury variance MMSD shall maintain effluent quality at or below an alternative mercury effluent (variance) limit of 3.4 ng/L, implement the "Mercury Pollutant Minimization Program Plan/Source Reduction Measures Plan" dated May 2017 and submit annual mercury progress reports as described in the schedule above.

9.4 Water Quality Based Effluent Limits (WQBELs) for Total Phosphorus (Outfall 005)

The permittee shall comply with the WQBELs for Phosphorus as specified. No later than 14 days following each compliance date, the permittee shall notify the Department in writing of its compliance or noncompliance. If a submittal is required, a timely submittal fulfills the notification requirement.

Required Action	Due Date
Compliance Alternatives, Source Reduction, Improvements and Modifications Status: The permittee shall submit a 'Compliance Alternatives, Source Reduction, Operational Improvements and Minor Facility Modification' status report to the Department. The report shall provide an update on the permittee's: (1) progress implementing source reduction measures, operational improvements, and minor facility modifications to optimize reductions in phosphorus discharges and, to the extent that such measures, improvements, and modifications will not enable compliance with the WQBELs, (2)	03/31/2021

status evaluating feasible alternatives for meeting phosphorus WQBELs.	
Preliminary Compliance Alternatives Plan: The permittee shall submit a preliminary compliance alternatives plan to the Department. If the plan concludes upgrading of the permittee's wastewater treatment facility is necessary to achieve final phosphorus WQBELs, the submittal shall include a preliminary engineering design report. If the plan concludes Adaptive Management will be used, the submittal shall include a completed Watershed Adaptive Management Request Form 3200-139 without the Adaptive Management Plan. If water quality trading will be undertaken, the plan must state that trading will be pursued.	03/31/2022
Final Compliance Alternatives Plan: The permittee shall submit a final compliance alternatives plan to the Department. If the plan concludes upgrading of the permittee's wastewater treatment is necessary to meet final phosphorus WQBELs, the submittal shall include a final engineering design report addressing the treatment plant upgrades, and a facility plan if required pursuant to ch. NR 110, Wis. Adm. Code. If the plan concludes Adaptive Management will be implemented, the submittal shall include a completed Watershed Adaptive Management Request Form 3200-139 and an engineering report addressing any treatment system upgrades necessary to meet interim limits pursuant to s. NR 217.18, Wis. Adm. Code. If the plan concludes water quality trading will be used, the submittal shall identify potential trading partners. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	03/31/2023
Progress Report on Plans & Specifications: Submit progress report regarding the progress of preparing final plans and specifications. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	03/31/2024
Final Plans and Specifications: Unless the permit has been modified, revoked and reissued, or reissued to include Adaptive Management or Water Quality Trading measures or to include a revised schedule based on factors in s. NR 217.17, Wis. Adm. Code, the permittee shall submit final construction plans to the Department for approval pursuant to s. 281.41, Stats., specifying treatment plant upgrades that must be constructed to achieve compliance with final phosphorus WQBELs, and a schedule for completing construction of the upgrades by the complete construction date specified below. (Note: Permit modification, revocation and reissuance, and reissuance are subject to s. 283.53(2), Stats.) Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	03/31/2025
Treatment Plant Upgrade to Meet WQBELs: The permittee shall initiate construction of the upgrades. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41. Stats. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	09/30/2025
Construction Upgrade Progress Report #1: The permittee shall submit a progress report on construction upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in	09/30/2026

the Surface Water section of this permit.	
Construction Upgrade Progress Report #2: The permittee shall submit a progress report on construction upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	09/30/2027
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	08/31/2028
Achieve Compliance: The permittee shall achieve compliance with final phosphorus WQBELs. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	09/30/2028

9.4.1 Explanation of WQBELS for Total Phosphorus Compliance Schedule

This compliance schedule applies only to Outfall 005 to Badger Mill Creek.

Subsection NR 217.17, Wis. Adm. Code, allows the department to provide a schedule of compliance for water quality based phosphorus limits where the permittee cannot immediately achieve compliance. This compliance schedule requires the permittee to comply with the final water quality based phosphorus limits within 8 ½ years. As part of the compliance schedule the permittee is required to submit:

- A Facility Plan (Compliance Alternatives Plan) to select a preferred compliance option for meeting final phosphorus WQBELs;
- Assuming that facility upgrades will be made to comply with the final phosphorus WQBELs, the last steps of the phosphorus compliance schedule are to: submit final plans and specifications for construction, submit progress reports, and comply with final phosphorus WQBELs. If an alternative compliance option is selected such as water quality trading or adaptive management, the compliance schedule will be amended to reflect these compliance options through either permit reissuance or permit modification.

The permittee will conduct a "Study of Feasible Alternatives" to determine whether Water Quality Trading or Adaptive Management, either alone or in combination with plant upgrades will allow the plant to meet the phosphorus WQBELs.

It is probable that, in order to consistently comply with the final phosphorus WQBELs, MMSD will need to evaluate and implement any number of the following approaches:

--Plant optimization;
--Phosphorus source reduction;
--Pilot testing of new or additional treatment processes;
--Additional treatment processes;
--Multiple treatment processes;
--Obtaining financing for construction;
--Potential for adaptive management and/or pollutant trading with upstream contributors, and implementation of such trades.

The Department believes that the compliance schedule suggested in the draft permit (8 ½ years) provides the appropriate length of time for the permittee to evaluate these options, implement the chosen option and meet the final phosphorus limits (WQBELs).

9.5 Effluent Disinfection Season Requirements

The permittee shall take the following actions to extend the time period for effluent disinfection to March 1 through November 30 annually for outfall 001.

Required Action	Due Date

Initiate Disinfection: The permittee shall commence disinfecting effluent discharged via outfall 001 to Badfish Creek by the Due Date. Disinfection shall hereafter be initiated on March 1 of each year and commence through November 30 of each year. Fecal coliform monitoring is required and limits apply during periods of disinfection per the requirements in the surface water section of this permit for outfall 001 and the Standard Requirements section.	03/01/2023

10 Special Reporting Requirements

Madison Metropolitan Sewerage District in collaboration with the Village of Oregon, City of Stoughton, and the WDNR Nevin Fish Hatchery have requested and the Department approved a plan to implement a watershed adaptive management approach. This proposed permit aligns the timeline of permit reissuance and expiration along with adaptive management dates for these facilities.

11 Attachments:

Water Quality Based Effluent Limits (WQBEL) – May 19, 2017

Map – May 19, 2017 WQBEL Memo, Page 32, Attachment 2

WET Checklist Summaries – May 19, 2017 WQBEL Memo, Page 28 (Outfall 001) & Page 29 (Outfall 005)

Substantial Compliance Determination – June 20, 2016

Madison Metropolitan Sewerage District Adaptive Management Plan – January 2017

Madison Metropolitan Sewerage District Adaptive Management Plan Amendment 1 – February 2018

Madison Metropolitan Sewerage District Adaptive Management Request Form – January 23, 2017

Alternative Effluent Limits for Temperature Approval Package – June 28, 2017

Temperature AEL Limits (Oct-Jan) Final – November 20, 2017

MMSD Chloride Pollutant Minimization Program/Source Reduction Measures – May 2017

MMSD Mercury Pollutant Minimization Program/Source Reduction Measures – May 2017

MMSD Public Notice Document for Chloride Variance – October 11, 2018

Off-Site Storage No Objection Letter – October 1, 2020

12 Proposed Expiration Date:

March 31, 2025

Prepared By:

Phillip Spranger, Wastewater Specialist

Date: March 30, 2020

Modified By:

Amy Garbe, Wastewater Engineer

Date: October 9, 2020